CLAIMS

What is claimed is:

1. (currently amended) A rapidly-deployable chain traction system comprising:

a sealed housing having an input and output apertures;

an electric drive motor, having reversable rotational output, secured to said housing and having an armature shaft extending through the input aperture;

an intermediate drive shaft rotatably mounted within said sealed housing;

a speed-reduction gear train interposed between said armature shaft and said spring-loaded clutch;

a worm axially installed on said intermediate drive shaft;

an output shaft rotatably mounted within said sealed housing and extending through said output aperture;

a deployment arm coupled to a portion of said output shaft that is external to said sealed housing, said deployment arm having rotatably mounted thereto a friction drive disc, said friction drive disc having peripherally attached thereto a plurality of chain segments;

a worm gear coupled to said output shaft, which meshes with the worm on said intermediate drive shaft, rotational movement of said worm imparting rotational movement to said output shaft; ~~and~~

a shock damper coupled to said output shaft, which mitigates shock loads applied to the worm and worm gear, said shock loads associated with rotational moments of the deployment arm caused primarily by uneven road surfaces; and

means for limiting torque applied to said output shaft by said electric motor.

2. Canceled

3. (original) The rapidly-deployable chain traction system of claim 1, wherein said worm and worm gear combination provides a further speed reduction between said electric drive motor and said output shaft, and also provides rotational locking of said output shaft.

4. (canceled)

5. (canceled)

6. (original) The rapidly-deployable chain traction system of claim 1, wherein said speed reduction gear train comprises a spur pinion gear mounted on said armature shaft which drives a driven spur gear axially mounted on said intermediate drive shaft.

7. (original) The rapidly-deployable chain traction system of claim 6, wherein said spring-loaded clutch comprises a driven disk affixed to said intermediate shaft, the driven spur gear which is mounted not only axially, but rotatably, on said intermediate shaft adjacent said driven disk, a friction disk rotatably interposed between said driven disk and said driven spur gear, and a biasing spring which compresses said friction disk between an adjoining face of said driven disk and an adjoining face of said driven spur gear, said spring loaded clutch acting to couple said driven spur gear to said intermediate drive shaft for torque loads up to a maximum determined by the spring constant of said biasing spring.

8. (original) The rapidly-deployable chain traction system of claim 7, wherein said shock damper includes a coil spring that is circumferentially, rather than torsionally loaded.

9. (original) The rapidly-deployable chain traction system of claim 1, wherein said worm gear is affixed directly to said shock damper.

10. (original) The rapidly-deployable chain traction system of claim 1, wherein said speed-reduction gear train, said spring-loaded clutch, said intermediate drive shaft, said worm, said worm gear, and said shock damper are immersed in an oil bath.

11. (currently amended) A rapidly-deployable chain traction system comprising:

a sealed housing having an input and output apertures;

an electric drive motor, having reversable rotational output, secured to said housing and having an armature shaft extending through the input aperture;

an output shaft rotatably mounted within said sealed housing and extending through said output aperture;

a speed-reduction gear train which couples said electric drive motor and said output shaft, said gear train incorporating an output shaft rotational locking device and a shock damper which mitigates shock loads applied to said rotational locking device, the shock loads being associated with rotational moments of the deployment arm caused primarily by uneven road surfaces;

a deployment arm coupled to a portion of said output shaft that is external to said sealed housing, said deployment arm having rotatably mounted thereto a friction drive disc, said friction drive disc having peripherally attached thereto a plurality of chain segments; and

means for limiting torque applied to said output shaft by said electric motor.

12. (original) The rapidly-deployable chain traction system of claim 11, wherein said speed-reduction gear train comprises:

a spur pinion gear mounted on the armature shaft;

an intermediate drive shaft rotatably mounted within said sealed housing; and

a driven spur gear rotatably mounted on said intermediate drive shaft and rotationally coupled thereto via said clutch.

13. (canceled)

14. (original) The rapidly-deployable chain traction system of claim 11, wherein said output shaft rotational locking device comprises a worm axially secured to said intermediate drive shaft; and

a worm gear coupled to said output shaft via said shock damper, said worm gear being driven by said worm.

15. (canceled)

16. (canceled)

17. (currently amended) A rapidly-deployable chain traction system comprising:

a reversable electric drive motor having an armature shaft;

an intermediate drive shaft;

a speed-reduction gear train which couples said armature shaft to said spring-

loaded clutch;

a worm axially affixed to said intermediate drive shaft;

an output shaft;

a shock damper affixed to said output shaft;

a worm gear affixed to said shock damper, said worm gear meshing with said worm, and providing rotational locking for said output shaft;

a deployment arm coupled to said output shaft, said deployment arm having rotatably mounted thereto a friction drive disc, said friction drive disc having peripherally attached thereto a plurality of chain segments; and

means for limiting torque applied to said output shaft.

18. (original) The rapidly-deployable chain traction system of claim 17, wherein said shock damper mitigates shock loads applied to said worm and worm gear, the shock loads being associated with rotational moments of the deployment arm caused primarily by uneven road surfaces.

19. (canceled)

20. The rapidly-deployable chain traction system of claim 27, wherein said spring-loaded clutch comprises a driven disk affixed to said intermediate shaft, the driven spur gear which is mounted not only axially, but rotatably, on said intermediate shaft adjacent said driven disk, a friction disk rotatably interposed between said driven disk and said driven spur gear, and a biasing spring which compresses said friction disk between an adjoining face of said driven disk and an adjoining face of said driven spur gear, said spring loaded clutch acting to couple said driven spur gear to said intermediate drive shaft for torque loads up to a maximum determined by the spring constant of said biasing spring.

21. (new) The rapidly-deployable chain traction system of claim 1, wherein said means for limiting torque applied to the output shaft by said electric motor comprises a spring-loaded clutch coupled to said intermediate drive shaft, said clutch limiting the amount of torque which may be applied to said intermediate drive shaft.

22. (new) The rapidly-deployable chain traction system of claim 1, wherein said

means for limiting torque applied to the output shaft by said electric motor is a circuit which limits current drawn by the electric drive motor to a preset maximum.

23. (new) The rapidly-deployable chain traction system of claim 22, wherein the current limiting circuit comprises a microcontroller, digital control logic, and for each electric motor, an analog PID current limit controller, an H-bridge FET driver, and a MOSFET H-bridge, each of said PID current limiter controllers receiving control signals from the microcontroller and an associated MOSFET H-bridge, said digital control logic receiving control signals from the microcontroller and the analog PID current limit controllers, and said H-bridge drivers receiving control signals from the digital control logic.

24. (new) The rapidly-deployable chain traction system of claim 11, wherein said means for limiting torque applied to the output shaft by said electric motor comprises a spring-loaded clutch that is incorporated in the gear train.

25. (new) The rapidly-deployable chain traction system of claim 11, wherein said means for limiting torque applied to the output shaft by said electric motor is a circuit which limits current drawn by the electric drive motor to a preset maximum.

26. (new) The rapidly-deployable chain traction system of claim 25, wherein the current limiting circuit comprises a microcontroller, digital control logic, and for each electric motor, an analog PID current limit controller, an H-bridge FET driver, and a MOSFET H-bridge, each of said PID current limiter controllers receiving control signals from the microcontroller and an associated MOSFET H-bridge, said digital control logic receiving control signals from the microcontroller and the analog PID current limit controllers, and said H-bridge drivers receiving control signals from the digital control logic.

27. (new) The rapidly-deployable chain traction system of claim 17, wherein said means for limiting torque applied to said output shaft is selected from the group consisting of spring-loaded clutch that is incorporated in the gear train and a circuit which limits current drawn by the electric drive motor to a preset maximum.